

- Title: GENIUS (GERmanium in LIquid NITrogen Underground Setup)
- Physics Goals
  - Measure neutrinoless double beta decay in Ge
  - Reach approximately 0.01 eV or  $10^{25}$  y
  - Energy resolution of germanium
  - Isolated from structural backgrounds
- Features
  - Germanium (100 kg) detector surrounded by liquid nitrogen
  - Outer shield doped with Boron for neutron absorption
  - Detector, too, for dark matter and solar neutrinos
  - Follows Heidelberg-Moscow experiment with 11 kg of 86% enriched  $^{76}\text{Ge}$
  - Genius based on conviction Heidelberg-Moscow experiment was limited by nearby radioactive sources
  - Test in nitrogen found 1 keV resolution at 300 keV
- Technological Challenges
  - Purity of Ge
  - Contamination by spallation
- LBNL Contributions
  - Experience with high purity Ge
- Status: 40 kg set up now
- Timeline: 40 kg set up now
- Location: Gran Sasso
- Collaboration
  - MPI Heidelberg
  - Moscow (Kurchatov)

- Nizhni Novgorod
- Funding Sources
- Resources, Links, and References
  - hep-ph/0206249 v1
  - <http://www.to.infn.it/~giunti/NU/exp/all/genius/>
  - [http://www.mpi-hd.mpg.de/non\\_acc/](http://www.mpi-hd.mpg.de/non_acc/)
- Summary prepared by R. Cahn